

AUGUST, 1959



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EDITORIAL



PROSPECTS FOR GENEVA

If the current international conferences do not wreck plans for the I.T.U. I will, by the time you read this, be on my way to Geneva together with other members of the Australian Delegation.

The fact that I am writing this in mid July makes it difficult to forecast what will happen there, but I think the picture is clear enough to estimate what our initial position is likely to be.

The International proposals as received were too incomplete to make any classification worth while, but certain trends are clear.

Neither the United Kingdom nor the U.S.A. are proposing to cut Amateur bands. The U.S.A. is actively opposed to losing frequencies especially to short wave broadcasting.

Its attitude is bound to carry great weight, particularly as it now has direct interests in Region 3.

In Europe there is a clear pattern to curb some Amateur activity for Region 1, and this is repeated in countries such as India, so strangely included in Region 3.

There is little doubt about the general pressure for frequency accommodation, so much so that some have suggested it would be easier to leave the high frequency allocations as they are now than to attempt any serious changes.

But to us, it is of more immediate interest to consider what took place at my first meeting with the Australian delegation in Melbourne a few days ago.

Here I was given a warm welcome, and an excellent hearing during discussions occupying almost a full day.

As I expected, none of the Australian proposals have been amended, but there are still so many from elsewhere which have yet to be tabled at Geneva that the real battles will take place there. And believe me they will not all concern the Amateurs!

Many countries are suggesting cuts to the 3.5 Mc. band—India nominates only 10 Kc. for Amateurs—and we may not succeed in holding our present allotment. But we must remember that, whereas at the mo-

ment we share the band with other services, the proposed 200 Kc. will be exclusive, and this has many advantages.

I hold considerable hope that the Conference will accept my suggestion for daylight sharing of the band between 7.1 and 7.3 Mc. in addition to the exclusive allocation 7-7.1 Mc. Let's face it—legal and illegal s.w. broadcast interference renders our full band almost useless at night, but with the exception of a few Australian stations which might start up there, it will be virtually unoccupied in this area during the day. The P.M.G. Department is apprehensive about how it will work, but I see no more problems than exist now in the shared 50 Kc. portion, where interference by Amateurs is unknown.

However, the delegates agreed to annotate this proposal for further consideration at Geneva, and if we all hammer this one, despite its novelty, I think we can get it. If so, it will be of enormous value to us.


Another annotation concerns a firm Amateur allocation in the 3900 Mc. band from which originally we were excluded. Otherwise, apart from some movement in the u.h.f. bands, halving the 56 Mc. band and sharing the wide bands above 1200 Mc., now nominally Amateur, with radio navigation, the allocations are likely to stay as they are.

There is so little support for reducing the 14 Mc. band that I doubt whether it will pass through at Geneva. American objections alone are likely to be so strong that it could well be abandoned.

Although for the reasons given above I am more hopeful than I was a few months ago; I am not underestimating the difficulties yet to be faced, but I know, too, that we will have friends at Geneva to help withstand the pressures we will meet there.

Be assured I will do all I can to justify your confidence in me, and the magnificent support you have shown by your many efforts to protect our bands and our future.

—JOHN MOYLE, VK2JU, W.I.A. Representative at the I.T.U. Conference.



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Tropospheric Propagation at V.H.F.

PART ONE

ALAN ELLIOTT,* VK3AEL

THE newcomer to the v.h.f. bands soon discovers that DX contacts are pursued as avidly on these frequencies as on the "DC" bands. On 144 Mc. and higher the meaning of DX in terms of distance is different, but the pleasure and interest of working stations beyond the normal range is one of the attractions of v.h.f. The normal range, that is the radius of communication at times when the band is said to be "dead", depends mainly on the location of the station, antenna gain, power in the antenna and noise figure of the receiver. With modern gear and a reasonable location this radius could be up to 100 miles.

However, it will be observed that there are many occasions, particularly during the summer and autumn, when signals from far beyond the normal range are audible at excellent strength. Reflection by the ionosphere at frequencies over 100 Mc. is very rare, so how does this come about? The answer almost always is refraction in the lower atmosphere, called the troposphere.

This article is an attempt to explain in qualitative terms, mainly for those who are just starting to take an interest in the one and two metre bands, how such refraction may arise. During World War II, the unexpected radar ranges sometimes encountered led to the discovery of the correlation between radio conditions and the weather which had previously been dimly perceived by Amateurs working on 56 and 112 Mc.¹

From the Amateur viewpoint the classic article by W2BAV in "QST" in 1949 gave v.h.f. enthusiasts the information needed to predict whether an opening might be possible by inspection of the daily weather map.² But sometimes the good conditions expected did not materialise and W2OBB demonstrated that insufficient refraction was present as disclosed by radiosonde readings of upper air temperature and water vapour content.³

DEFINITIONS

It will be necessary to delve a little into physics and meteorology, so let us start with some definitions.

The Troposphere: In general there is a gradual decrease in temperature with increasing height above ground level averaging about 3 degrees Fahrenheit per 1,000 feet. At an altitude of about 40,000 feet, the temperature is about 60°F. below zero but above this altitude the temperature ceases to decrease regularly. The atmospheric layer in which the temperature falls with height is called the troposphere and is the layer where nearly all of the conditions controlling the weather are to be found.

Vertical Temperature Gradient: The rate of change of temperature with height is called the vertical temperature gradient or lapse rate. When the lapse rate is less than 3°F. per 1,000 feet, an inversion is considered to exist, even

though the upper air temperature may be lower than at ground level.

Adiabatic Temperature Changes: When a gas is allowed to expand by reducing the pressure on it cooling takes place, and similarly when a gas is compressed its temperature rises. These temperature changes which occur without receiving or giving heat to or from the surroundings are called adiabatic temperature changes. The operation of a diesel engine, the heating of the air inside a bicycle pump as it is used and the cooling of air escaping from an inflated balloon are familiar examples.

Mixing Ratio: The moisture content of the atmosphere may be expressed in various ways. The most convenient for our purpose is the weight in grams of water vapour mixed with one kilogram of dry air. This is the mixing ratio.

RADIO REFRACTIVE INDEX

For distances greater than line of sight the radio wave must be bent downwards towards the earth at some point along its path or alternatively the refraction may be gradual and extend over a considerable portion of the path. In either case the wave must encounter a discontinuity or gradient of refractive index such that there is a reduction of refractive index with height. Electromagnetic waves travel faster if the refractive index of the medium is reduced, therefore a wave travelling horizontally in an atmosphere having a negative gradient of refractive index with height will be bent towards the earth. As the top of the wave front moves ahead of the lower part. The refractive index of dry air is almost the same for radio waves and light waves and is given by the expression $n-1 = 10^6 \times 79 (P/T)$ where n is the refractive index, P is the pressure in millibars, and T is the temperature in degrees absolute. Thus a decrease in P or an increase in T would reduce n .

The refractive index of water vapour, which is always present in the atmosphere, differs for light and radio waves because the water vapour molecule has a dipole moment which varies with frequency. It may be shown that the radio refractive index increases as the water vapour content increases.⁴ The total radio refractive index is obtained by adding that due to water vapour to that of dry air. The combined effect of the normal lapse of pressure, temperature and water vapour is such that the R.R.I. falls slowly with height, causing the radio range to be extended to about 20% beyond line of sight in the absence of other effects. With modern gear and reasonable power, this distance is exceeded mainly because of diffraction, reflection and scattering.

DX BY ANOMALOUS PROPAGATION

The gradient of R.R.I. required to cause a ray transmitted horizontally to assume a radius of curvature equal to that of the earth, and the individual

changes of temperature pressure and water vapour required to cause it may be calculated.^{1,2} When the gradient of R.R.I. is greater than this, super-refraction is said to occur.

The effect of the vertical gradient of pressure is not negligible, but is too small to cause super-refraction by itself and is almost constant. Thus super-refraction must be caused by an increase in temperature with height or a decrease of water vapour content of sufficient magnitude. An unfavourable lapse rate of temperature may be combined with a very favourable reduction in water content or vice-versa, but in practice it is usually found that favourable gradients of both are present, or that a reduction of mixing ratio alone is the significant factor.

For super-refraction to occur, the minimum rate of temperature rise necessary is about 3°C. per 100 feet.¹ The minimum rate of decrease in mixing ratio is about 0.5 gram per kilogram per 100 feet.⁷ In addition it would seem that the total temperature rise must exceed about 10°C. or the mixing ratio drop more than at total of about 1.5 gram per kilogram for the refraction to be of practical effect for micro-waves.² Observation has shown that this seems to apply to 144 Mc. also. In other words the discontinuity must extend over a depth of at least 300 feet when the temperature or humidity lapse rate is at the minimum value.

THE WEATHER FROM THE V.H.F. POINT OF VIEW

If there is a condition where a layer of comparatively warm dry air exists over a layer of cooler moist air and where the temperature and water vapour differences are great enough, v.h.f. radio waves may be propagated for several hundreds of miles and the band is "open". Since the writer is not a meteorologist, explanations of the ways in which suitable tropospheric conditions may come about have been based on elementary text books.^{3,4}

Nocturnal Cooling Over Land

Heat from the sun passes through the atmosphere to which it is almost transparent and warms the surface of the earth which in turn warms the air near the surface by contact and convection. At night in the absence of cloud, heat escapes from the earth into space, causing the air close to the surface to be cooled by contact, but the air temperature several hundred feet aloft may not be greatly different from what it was the afternoon before, thus a temperature inversion may exist and will be at a maximum with clear skies and no wind. A cool night following a hot summer day or a clear cold calm winter morning may indicate a band opening. Topographical features restrict the distance which may be covered.

¹ Gibbs gives 4.5°C. per 100 feet for micro-waves.

* 31 Fenton Street, Ascot Vale, Vic.

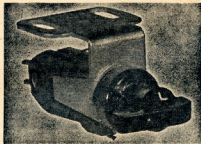
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Advection from Land to Sea

The temperature of the sea does not change greatly from day to night, so the above process is not very marked over the sea. However, the horizontal movement of air (advection) may cause a mass of air warmed by contact with the land to move across the coast over relatively cold water. The lower layer of air is then cooled forming a temperature inversion, and if the air was originally dry evaporation from the sea would cause a drop of water vapour with height to develop as well. The combined effect could result in the formation of a duct in which the wave may be trapped similarly to a wave guide. The shorter the wavelength, the shallower the duct needs to be to contain the wave, therefore band openings by surface ducting should be more frequent on the higher frequency bands.

Coastal Inversion

Coastal inversions may occur in Australia during the warmer months when the land temperature rises considerably above that of the sea. Warm air over the land rises because of its lower density and is replaced by cooler air from the sea. The uplifted air flows across the coast resulting in a cycle of air movement causing a sea breeze with associated temperature inversion (Fig. 1). This effect may be noticed several miles inland.

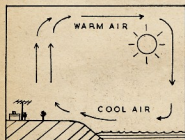


FIG. 1 COASTAL INVERSION

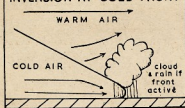
Subsidence Inversion

The pressure systems which move across the continent generally from west to east are formed by a complex series of events including the rotation of the earth, the heating effect of the sun, and the presence of land and sea masses. These pressure systems are shown on the weather map as irregularly shaped areas enclosed by lines called isobars, connecting places of equal barometric pressure. Winds are caused by the movement of air from high pressure to low pressure areas, but due to the rotation of the earth and ground friction, the direction of the wind is about 30 degrees from the isobars over land and about 10 degrees over the sea at low altitudes.

Outflow of air near the surface from a high pressure area results in the air above sinking to replace it. As the air sinks it becomes subjected to greater pressure, causing the temperature to rise as it is compressed adiabatically. In the absence of evaporation or condensation the mixing ratio would be unchanged but the vertical gradient of mixing ratio, which usually decreases with height, would be accentuated by the compression. The boundary be-

tween the warm air in the "high" and the cooler air in an adjacent "low" is not vertical. There is very little mixing between masses of air at different temperatures, thus the warm air tends to spread out over the denser cooler air around the edge of the "high" which may produce a strong inversion of temperature or mixing ratio, or both. Over the sea, subsidence may cause ducting when evaporation increases the water vapour lapse in the lower layers. Subsidence is the most frequent single cause of super-refraction, at least in southern Australia. A diagrammatic representation of a cross section through a "high" is given in Fig. 3.

FIG. 2 TEMPERATURE INVERSION AT COLD FRONT



Cold Fronts

If a mass of air warmed by traveling over land for some time in summer is followed by a mass of air cooled by contact with a southern ocean, the boundary at ground level may be sharply defined. The cold air forms a wedge under the warm air with a slope of about 1 in 100, producing a temperature inversion and possibly a reduction in water vapour content. Squalls and thunderstorms are associated with an active cold front and the augury for DX is poor. However, it sometimes happens that the warm air forced aloft by the cold wedge is very dry so the front will pass over without any rain or even without cloud (Fig. 2).

It has been noticed that a weak cold front of this type between two high pressure areas will sometimes cause the band to open, particularly along a line almost parallel to the front shortly after it has passed over one or both stations. Cold fronts are shown on the weather map as thick lines with spikes pointing in the direction of travel. Warm fronts may also exhibit inversion, but are comparatively rare in Australia.

To sum up, the conditions which may indicate a band opening may be as follows:

1. A cold calm night following a warm day.
2. At the edge of a high pressure area. It has been found that the

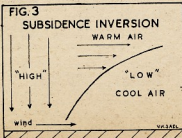


FIG. 3 SUBSIDENCE INVERSION

trailing edge is usually, but not exclusively, more likely to be favorable (i.e. falling barometer), particularly if the trailing edge is very extended. There have been so many exceptions to the "along the isobars" theory that it is not of much help.

3. Paths across elongated "highs" or islands of "highs". Paths inside a large "high" are usually not good.
4. Ducting over the sea.
5. Paths nearly parallel to a cold front shortly after a cool change without rain, particularly when the front is between two "highs". Observations in Victoria have shown that paths crossing a cold front at right angles are usually poor.
6. In general, the presence of a low pressure area will be associated with a "dead" band. If the barometer is high and steady, conditions may not be much above average, but look for DX when the barometer is rising or falling as a "high" crosses your station. If the centre of the "high" passes to the north or south, the barometer may be almost steady and not very high (say between 29 and 30 inches) but the band may be open.

Conclusion

By watching your barometer and the weather maps in the daily paper you will be warned in advance of possible openings. Good conditions are not confined solely to the warmer months—many good openings have occurred in winter.

Typical weather maps illustrating the more frequent types of band openings with tracings of radiosonde charts giving curves of temperature and water vapour in the upper air on those days will be given in Part Two.

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HI-FIDELITY FESTIVAL RESULTS

In conjunction with Melbourne's recent Hi-Fidelity Festival in aid of the Alfred Hospital Building Appeal, J. H. Magrath & Co. Pty. Ltd. arranged a special Hi-Fi Competition for home constructors Amplifiers.

The judges unanimously awarded an outright prize of £20 to Mr. J. E. Fitzgerald, 71 Bellett St., Camberwell, Vic., after the "Stereorama" Concert at the Melbourne Town Hall on Friday evening, June 12, and the winner was congratulated on his craftsmanship and the meticulous quality of his entry.

OUR HOBBY ON DISPLAY

Background of Student-to-Student Amateur Radio Contact from Morwell High School (Vic.) through VK3BB on 7th and 8th May, 1959

When the Advisory Council of the Morwell High School (94 miles south east of Melbourne) decided to conduct a Fair on Friday, 8th May, to raise funds, it was agreed that educational features as well as the usual money-raising ones should be included.

Mr. H. S. Lazarus, the President of Morwell Chamber of Commerce and a member of the Advisory Council, asked Mr. A. E. (Bert) Budge (VK3BB) whether he could do anything to help on Fair Day. Bert suggested that he could shift his station to the School for the day, and that it might be possible to arrange for a student-to-student contact.

Mr. Budge and the Headmaster of the School (Mr. A. H. Morris) made an official approach to the Postmaster General's Department for permission to operate from Morwell High School, and for a special call sign for the occasion. The P.M.G. was also asked to lend an AR-88 receiver, a specially selective one, and to give technical assistance before and on the day, if such were necessary.

from the States. The A.R.R.L. offered all assistance, and several letters were written on each side discussing details.

Working independently whilst waiting for A.R.R.L. replies, Bert VK3BB, during long hours at the High School, succeeded in making many contacts in various countries, and explained the idea. The co-operation received was excellent from the following stations, which did not, for one reason or another, take part in the actual proceedings on Fair Day:

W9WE, W9YRO, W9HRV, W9RNL, K6TCZ, K6SSA, K6BAH, K5OSH, W1BEQ, W1BCR, W1ONK, W2MI, W4APS, ZL3FM, ZL3GG, ZL3VI, ZL3US, ZL2AIX, KH6DEU, VR2CC, G3JAF, VP8UL and K4CUSB.

None of the stations arranged for us by the A.R.R.L. were contacted. This was unfortunate, as we have no doubt of the interest of the stations concerned. We looked for WINFT, W6UED, KH6IJ several times, and cabled these stations for schedules, all unsuccessfully. The vagaries of radio contact were to blame.

for the excellent cover the project was given from its inception. The story was carried also by the Melbourne "Age," "Sun" and "Herald" and over the Victorian A.B.C. radio news.

Victorian television station ABV2 (A.B.C.) asked whether we could put on the show a day early, on Thursday, May 7, so that a film could be taken and shown over t.v. on the Friday of the Fair. Naturally, we accepted the suggestion, although it meant last minute changes in the schedules arranged. Several stations were asked to come on for both days.

Unfortunately for our plans, ZL3FM (Christchurch, N.Z.) informed us on the Wednesday that the Radio Inspection Branch there would not allow the student-to-student broadcast, so we reluctantly had to drop ZL3FM and several other ZL stations interested from the scheme. Similar news came to us from G3JAF (Hants, U.K.).

A further setback came on television day—the Thursday. At 9.30 a.m. VR2DO cabled as follows: "Regret authorities disallow student participation". Act-



Left: Three students and a staff member are at the table with the second microphone.



Right: A section of the crowd, at 10 p.m. on May 8 (while in contact with W4AHK and W4APS), is typical of the interest shown throughout the day.

Official permission was granted for VK3BB to be operated from the School from April 24 to May 9 inclusive, after certain safeguards were agreed to by Bert VK3BB and the Headmaster. No special call sign was granted, but the words "operating from Morwell High School" were to be added after VK3BB. An AR-88 receiver was also made available. Mr. C. Manning, Radio Inspection Branch, visited the School and assisted throughout all the proceedings on May 8.

The School received wonderful co-operation from the State Electricity Commission officers in Morwell, who erected two 50 ft. poles, as well as the Lazy H antenna which was beamed on the United States of America.

In the meantime, Bert VK3BB wrote to Mr. Perry Williams, Assistant Secretary of the A.R.R.L. (W1UED), in West Hartford, Connecticut, U.S.A., outlining his hopes for a student-to-student contact and asking for help

A very exciting cable on Fair Day eve came from Mr. Perry Williams of the A.R.R.L., as follows: "Look for W1AW 21330 Kc. 0230-0315 GMT May 8. Parker and group will be on hand. 73 Williams." Mr. Parker is the President of the West Hartford Club, made up of High School students.

At Morwell High School, staff and about 24 students went into training on microphone technique and prepared a series of questions for the day. These questions were airmailed to many of the stations named above to facilitate their preparations. Answers were also prepared at Morwell for our own use in reply.

The support of radio, television and the press in Victoria was very gratifying. Commercial radio stations 3UL Warragul and 3TR Sale, and the Australian Broadcasting Commission's Regional Station 3GI, also at Sale, gave us excellent advance publicity, as well as on the day. The Morwell "Advertiser" deserves our special thanks too

ually, Suva was timed to come in for television at 6.0 p.m. E.A.S.T. with two boys from Suva Boys' Grammar and two girls from Suva Girls' Grammar School. We cabled back instantly for VR2DO to keep the schedule and to ask and answer questions himself, if necessary. Mr. Lazarus, President of the Morwell Chamber of Commerce, then rang Canberra and was in touch with the Trade Commissioners for New Zealand and for the United Kingdom. Attempts were made at that late hour to overcome the difficulty, but unsuccessfully, due, we feel sure, to lack of time. Had we made earlier approaches to the correct authorities, we feel we would have had 100 per cent. co-operation for all countries concerned. The lack of such an approach must be put down to our inexperience.

On the Thursday, May 7, we had several stations standing by on schedule, notably K9PTQ, with students from New Trier High School, Winnetka, Ill.; K6BAH, Uplands, Calif., with students

First class contact was made with K9TPQ with whom a long student-to-student contact was made—for one hour. Other equally good contacts were VR2AS (Suva) for half an hour, and W4AHK, with W4APS standing by, for one hour and twenty minutes.



Bert Budge, VK3BB (in front), and Gordon Morrison, VK3TH (at rear) at the controls of VK3BB/P.

The public interest in the Radio Room at Morwell High School for the fortnight that VK3BB operated there was intense. On the actual Fair Day, large crowds were in the room over a period of many hours. Participating students at Morwell maintained their own interest throughout, and obviously were delighted at being able to share in what was for them a rich experience.

One result of the experiment is that Morwell High School intends to set up its own Amateur Radio Station when members of staff obtain their licence. Also, special QSL cards with photographs of the proceedings and of the School and district are to be sent to those Amateurs who helped.

Bert VK3BB wishes to thank all Amateurs who assisted him in any way, and particularly those who had repeated schedules with him. His thanks go, too, to the students of participating Schools.

The Headmaster of the Morwell High School, Mr. Allan Morris, also thanks them all, and also Mr. Budge, for a wonderful example of international co-operation in an unusual educational experiment. All at Morwell High School have no doubt as to its success.

A. E. BUDGE, VK3BB.
A. H. Morris, Headmaster.

PAINLESS NOISE LIMITING FOR 13/6

GEORGE H. CRANBY,* VK7GC

THE other night I was sitting in front of my modulator trying to make the speech clipper behave. At the same time I had the receiver running, enjoying some juicy QRN on 40 metres. Suddenly a thought struck me, and out came the speech clipper circuit diagram, paper and pencil. It all looked so simple—it was just too silly!

A little discussion next morning with Bill VK7MC convinced me that it was not so silly, really, and the same night an half hour (yes, half-an-hour) of work proved the pudding. It works, and it works that-away:

It's the old shunt diode limiter, used in the audio stage with variable blocking bias. As can be seen, a reference voltage is taken from the joint between the two 20K resistors (they can be 22K, or anything thereabouts) to a d.c.-blocked section of the audio input line. A dropping resistor is inserted also.

Positive peak clipping is provided by the l.h. diode which has positive bias with respect to reference; the second diode clips negative peaks, the cathode being connected to reference, and the plate to earth; earth being negative to reference.

The variable blocking voltage is derived from the cathode bias resistor of the audio output stage, the resistor actually being a potentiometer of appropriate value.

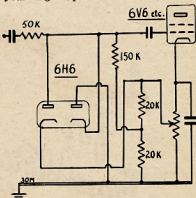
That's all there is to it, chaps. With the potentiometer slider in top position, and with 12 volts total bias, there is 6 volts bias on the clipper cathodes and clipping starts when the peak audio amplitude exceeds 6 volts. As the slider comes down towards the earth end the bias voltage drops and clipping starts at lower peak voltages. Noise can never exceed peak audio level.

* 6 Barrack Street, George Town, Tas.

It is actually possible to clip the audio input peaks until distortion starts, without losing much audio volume, but at the same time reducing random noise peaks.

As a refinement the potentiometer could be reduced to, say, 350 ohms, and a fixed 150 resistor connected at the earth end. This would limit the amount of clipping to prevent total cut-off.

In practice, the noise limiter on-off switch of the existing receiver is simply replaced by the potentiometer knob, and any degree of limiting is at your finger tip.



The cost:—

1 6H6 valve	2/6
1 socket	1/3
1 potentiometer	5/6
4 resistors	3/0
1 mica capacitor	1/3
	<hr/> 13/6

Try it, chaps!

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Model 6a 3/32" (Push-on)	6	6	0.25 oz.	6"	As for Model 6 (for extremely delicate work only).
Model 9 5/32" (Push-on)	6, 12, 24-27½	8.3	0.25 oz.	6"	Hearing Aids, Radio and TV Sub-assemblies, Coils, Electronic Instruments, Model Construction, Electro-Medical, etc.
Model 12 3/16" (Push-on)	6, 12, 24-27½	12	0.5 oz.	6.25"	Radio, Television, and Telecommunications assemblies.
Model 18 3/16" (Push-on)	6	18	0.75 oz.	7½"	For heavier work, heat capacity equivalent to that of most 80 watt soldering irons.

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MSP3.58

Amateur Radio, August, 1959

SIMPLE SIDEBAND

PARTS SEVEN and EIGHT

A SIMPLE VOICE CONTROL SYSTEM FOR EITHER A.M. OR S.S.B.

"How's copy, John?"
 "A little QRM. How am I?"
 "There's some on you, too?"
 "Well, follow me up. I'll go up five."
 "OK... OK, I have you now. How am I?"
 "Fine."

The above of course is an extract from a typical voice controlled operation. Note the similarity between this and the telephone or "duplex" operation. The only difference is that in this case you can't actually listen on the frequency at the same time as you are speaking. But pause for breath and bingo! in comes the reply. Just like that.

Although it took the s.s.b. boys to make this form of operation popular, there never has been any real reason why it could not have been used by a.m. stations provided one or two little points are observed.

The stations concerned must operate exactly on the same frequency otherwise, when two stations accidentally transmit together, which of course happens often, a loud heterodyne will blast your ears off. The only other requirement is that you switch off the a.v.c. and operate on "manual" to prevent the noise surging up when the carriers are off. You might of course fit a squelch circuit and have de-luxe a.m. v.o.x.

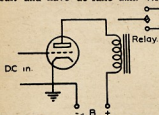


Fig. 1.—D.C. applied to grid will cause relay to open or close.

V.o.x. circuits are really simple and the "bits and pieces" will be found in almost every junk box or piece of surplus equipment. This will prevent you from spending the money the XYL gave you to pay the butcher! (Better the junk box than the "dog-box".)

There are two generally used systems of v.o.x.—those which use relays and those which don't. Both work well but simplicity is on the side of the relay system. Certainly, it is more versatile and is more readily adapted to suit various types of transmitters. It is the system I propose to discuss.

Fig. 1 shows a triode amplifier which, instead of having a resistor or a transformer in its plate circuit, has a relay. Most of you who managed to struggle past the primers realise that if we apply a positive bias to the grid of the tube we will get an increased plate current. If we apply a negative voltage we get a decreased plate current. When

sufficient plate current flows the relay clapper pulls down, and when the plate current decreases the relay clapper lets up. We arrange the contacts to switch the transmitter and receiver on and off. To get our d.c. voltage we steal a little audio from the transmitter pre-amp. when the volume control is not looking and with a diode we rectify it and apply it to the grid of our relay tube. And that's all there is to it!

It is more usual to arrange the bias on our relay tube so that when no d.c. is applied to the grid of the d.c. amplifier the relay stays closed. We do this by putting a potentiometer in the cathode circuit and adjusting the resulting voltage drop until the plate current allows the relay to hold down.

Now, when you say, "Hello John," your mike converts the sound to audio, a diode rectifies the audio and gives you a negative d.c. voltage and this you apply to the grid of the relay tube which responds by causing the relay to open, the transmitter to switch on, the antenna to switch from transmitter

receiver off (and vice versa) there arises another problem. When John at the other end says his "Hello", the sound coming from the speaker of our receiver immediately switches on the transmitter. It happens so quickly that about all we get is the "alf ah haitch". To overcome this, one could wear phones and although phones do exclude the XYL's "Come and get it!" that's not much use if you have to go hungry. Fortunately for the peace of the home we are readily able to overcome this little problem merely by rectifying a portion of the receiver output with the rectifier connected so that we get a positive d.c. output voltage. This, when applied to the grid of the relay tube (or d.c. amplifier which is its correct designation) opposes the negative voltage and thus we get cancellation. In other words, you are able to say your "Elo John" and John is able to reply with his "Elo Bill" without the transmitter behaving like a multi-vibrator gone mad. This circuit we call **antitrip**.

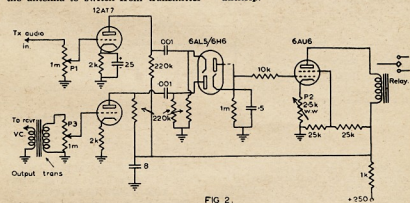


FIG. 2.

to receiver, and the receiver to "dead-en". But so that the relay does not open in between "Hello" and "John", you arrange a long time constant by placing a condenser from the grid of the relay tube to ground and this stays charged between words, but leaks away when you pause at the end of the sentence. There is nothing worse than to have a time constant here that is too short and allows relays to clash and bang throughout a sentence. Conversely, you don't want the relay holding in too long when you pause or you miss the other fellow's short replies.

No matter how good the voice control system, you will always lose a portion of the first letter or word because it takes a certain amount of time for the condenser to charge up and the relay to open and the transmitter to switch on. Don't be surprised therefore, if out of your "Hello John" you lose "alf ah haitch". This will hardly be noticed and in practice, because you tend to speak in "bursts", is discernible only by careful listening.

Now that we have our voice control switching the transmitter on and the

Fig. 2 shows the complete circuit of the v.o.x. used at this and a few other stations. The 12AT7 (or similar) is a voltage amplifier. One section amplifies the audio from the receiver and the other the audio from the audio pre-amps. In the exciter. This latter point is taken off just before the volume control so that the v.o.x. is independent of gain control settings.

The two triodes feed the two diodes whose d.c. outputs are combined in the 1 meg. resistor and applied to the grid of the 6AU6 through a 10k grid stopper.

The method of adjustment is as follows: Turn down the receiver gain. Turn down P1 and P3. Adjust P2 until the relay closes. Talk into the mike and turn up P1 until the relay opens and functions as I have already described. Now turn the receiver to normal room level. The receiver will, of course, trigger the relay. Turn up P3 until the relay ceases to chatter. When you speak into the mike the relay should click in and out normally yet be unaffected by the receiver noise. Do not turn P3 higher than necessary or you will have to turn P1 up to match. This

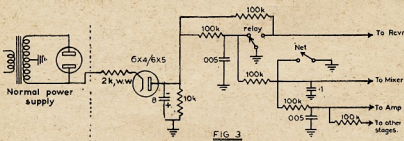
will cause you to yell into the mike to get the relay to "click" in.

Here are one or two bug-shooting points. By using the phones, make certain no hum is getting in from the receiver. Make sure that no clicks are coming in through the power supply and getting into the 12A7T stage. Check this by connecting a 0.1 μ F. condenser in series with the phones and hooking the lot across the power supply. Clicks heard here will trigger the relay.

If the relay responds to noise pulses from the receiver try placing a 0.001 to 0.01 μ F. capacitor from either or both plates of the 12A7T to ground.

There are several ways by which you may use the relay to "kill" the receiver and transmitter. You may use the contacts to switch off the h.t. to the exciter, the supply to the antenna relay, and in its turn, the h.t. to the receiver. If you wish, you may short out an audio stage in the receiver or short out the speaker. I tried many methods and only after much experimenting did I decide in favour of the system that uses a negative bias to bias off the unwanted tubes. This method may make use of an existing power transformer.

In addition, all that is required is a 6X4 or 6X5 rectifier, an electrolytic condenser and a 10k bleeder resistor.



(See Fig. 3.) By applying this bias through isolating resistors (as you would in your a.v.c. in the receiver) to the grids of the tubes you wish to disable and then using the relay to short out the bias so that the tube (or tubes) is allowed to operate, one has a near perfect system of switching which is absolutely free from clicks and squawks, a system which allows "shaping" of the characteristics to almost any desired degree.

In my own case I apply the bias to the suppressor grid of an r.f. stage in the receiver and to the output through a small neon bulb. This neon is optional but does remove the last vestige of thump when the receiver gain is high. You can, of course, apply the bias to the a.v.c. line but this does prevent you from using long time constant a.v.c. because the receiver will take some time to recover.

By removing the bias to the exciter (by shorting it out) its tubes are able to function. Again this is effected without clicks and bangs.

The bias may also be applied to a T/R switch if one is used. In my own case, I use a set of points on the v.o.x. relay to switch an antenna relay. I find this method very satisfactory so long as the antenna relay is quiet or put in a sound proof box.

A word about v.o.x. relays: Any relay with about 5,000 to 20,000 ohms resistance will perform just so long as it does not take too much current to close it. This is especially true if it closes on less than 8 mA.

One further point; if you bias off an oscillator to "kill" it you may be troubled with either frequency shift or squawks. This is one of the reasons it is usual to use oscillators outside the Amateur bands and then heterodyne to get to the desired frequency. This allows you to "kill" the mixer yet leave the oscillators running. On a.m., of course, the frequency shift would not bother you but on d.s.b. and s.s.b. of course, it is important.

Concluding, I must say that there is something gratifying in being able to hear QRM almost the moment it comes on the frequency. It has happened though, that sometimes I have begun a CQ call and part way through have had a station come up on the frequency continuing a contact he has been having with a station on a different frequency. This means, of course, that you put your tail between your legs and shift frequency, leaving the other fellow to it. The "facesaver" is that had you been on "overs" you would have continued and no one would have got through!

between s.s.b. and audio. (Voice is s.s.b. in fact!) Imagine how your pet hi-fi would sound doubled! That's about how I reckon the s.s.b. would sound. (It is like that to some, I have been informed!)

Heterodyning to the wanted frequency in a receiver does not cause distortion to the signal and we heterodyne in the transmitter for exactly the same reason. In a filter rig it is not practical, and indeed, it would be well impossible, to have the filter variable, tune to whatever band you would transmit on. A phasing type transmitter can and often is made to produce s.s.b. on the working frequency but this is the exception rather than the rule. Various factors influence design toward the heterodyning principle. Several of the reasons are: (a) it is usually easier and cheaper to produce s.s.b. on one frequency; (b) it is difficult to design a phasing rig that will retain the same sideband suppression over a band of frequencies; (c) it is too easy to get feedback to the oscillator when the output is on the same frequency. There is nothing worse than a s.s.b. signal whose carrier was also f.m. modulated before it was suppressed (if you have heard this you will most certainly agree with me); (d) in using voice control it is undesirable to switch off the v.f.o. each time you go over to "listen". It will be most difficult to keep the oscillator stable when it is periodically heated then allowed to cool and it is difficult, though not impossible, to "kill" the oscillator immediately you go to receive, otherwise each pause for breath may be shattered with the agonised gasp of a dying oscillator. Killing the oscillator quickly will produce key clicks both in the receiver and on the air.

In producing s.s.b. inductive filters are usually designed around the 10 kc. to 30 kc. frequencies. Mechanical and xtal filters usually operate around the 100 kc. to 500 kc. frequencies. Taking say 500 kc. as an example, it is now necessary to feed a v.f.o. of around either 3.3 megs. or 4.3 megs. along with the 500 kc. signal into a mixer tube such as a 6BE6 to get 3.8 megs out. It is important to realise that the proper selection of one of the two oscillator frequencies available determines which sideband will be transmitted. Frequency conversion may invert the sideband.

In a phasing type rig this is of little consequence because it is so easy to switch to the opposite sideband in the generator itself, but in a filter rig this is of the utmost importance. You may deliberately generate a lower sideband then inadvertently invert it in the frequency conversion process. Exactly the same inversion may take place in your receiver converter, where you may easily invert the sideband and it is this that causes the need to tune a receiver backwards when some converters are used ahead.

One other trap for young players is the image. In a receiver this may show up as annoying QRM, but in a transmitter this will show as output outside the Amateur band. No doubt the authorities will find this annoying! Stop and think about it: We have a generator at 500 kc.; have a v.f.o. (local oscillator in a receiver of say 3.3 megs.; we feed

HETERODYNING FILTER AND PHASING TYPE S.S.B. GENERATORS TO THE WORKING FREQUENCY

The need to heterodyne the s.s.b. generator to the working frequency has probably lost more customers to s.s.b. than has any other portion of the seemingly complex circuitry used in this fascinating form of transmission. Fellows listen to the glib that: "... take one mixer circuit, add one overtone oscillator, insert a series tuned trap, mix again, add pepper and salt to taste ...!" It doesn't take much to make a fellow give up! Yet the actual business of heterodyning is basic and used in almost every receiver worthy of the name receiver. The transmitter circuitry can be identical in almost every way. Images, one of the receiver problems, can be just as troublesome in the transmitter if care is not used in the selection of the appropriate frequencies. Fortunately though, we are free from signal-to-noise ratio problems, the signal level being in this case considerably higher than in a receiver.

Why heterodyne? is one of the questions I am often asked. Why not double as in a.m.? You can double if you wish though I do hope I am not on the receiving end when you do. Except for its frequency there is little difference

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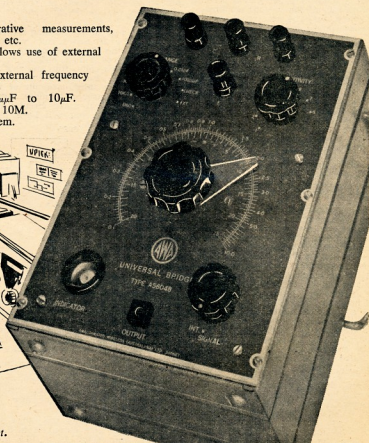
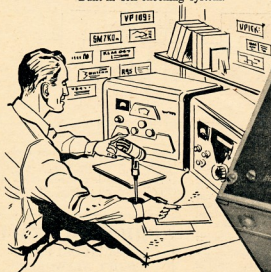


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VK-ZL DX CONTEST, 1959

Phone—1000 GMT, Saturday, 3rd October, to 1000 GMT, Sunday, 4th October

CW— " " " 10th " " " 11th "

N.Z.A.R.T. and W.I.A., the National Amateur Organisations in New Zealand and Australia, invite world-wide participation in this year's VK-ZL DX Contest.

Objects: For the world to contact VK and ZL Stations and vice-versa.

When?: Phone—24 hours from 1000 G.M.T., Saturday, 3rd October, to 1000 G.M.T., Sunday 4th October.

C.W.—24 hours from 1000 G.M.T., Saturday, 10th October, to 1000 G.M.T., Sunday, 11th October.

Duration for all contestants is 24 hours.

RULES

1. There shall be three main sections to the Contest—

- (a) Transmitting Phone.
- (b) Transmitting C.W.
- (c) Receiving—Phone and C.W.

2. The Contest is open to all licensed Amateur transmitting stations in any part of the world. No prior entry need be made. Mobile Marine or other non-land-based stations are not permitted to enter the Contest.

3. All Amateur frequency bands may be used, but no cross-band operating is permitted.

4. C.W. will be used for the second week-end and Phone for the first week-end. Stations entering for both Phone and C.W. must submit entirely separate logs for each.

5. Only one contact per band is permitted with any one station for Contest purposes.

6. Only one licensed Amateur is permitted to operate any one station under the owner's call sign. Should two or more operate any particular station, each will be considered a competitor, and must submit a separate log under his own call sign.

7. Entrants must operate within the terms of their licences.

8. **Cyphers:** Before points may be claimed for a contact, serial numbers must be exchanged and acknowledged. The serial number of five or six figures will be made up of the RS (telephony) or RST (c.w.) reports plus three figures which may begin with any number between 001 and 100 for the first contact, and which will increase in value by one for each successive contact, e.g. if the number chosen for the first contact is 053, then for the second contact the number must be 054, for the third 055, and so on. If any contestant reaches 999, he will start again with 001.

9. **Entries** must be set out as shown in the example below, using one side of the paper only. Entries must be post-marked not later than the 31st October, 1959, and addressed to the Federal Contest Committee, W.I.A., Box 2611W, G.P.O., Melbourne, C.I., Victoria, Australia.

10. Scoring: For VK-ZL Stations

only.—Five points will be scored for each contact on a specific band with an overseas station, and in addition for each new country worked on that band **BONUS** points on the following scale will be added:—

1st Contact	50 points
2nd "	40 "
3rd "	30 "
4th "	20 "
5th "	10 "

For the purpose of this rule the official countries list will apply with the exception that each VE, W, and ZS call area will count as a separate country.

For Overseas Stations.—Five points will be scored for each contact on a specific band with a VK or ZL call area (ZL1, 2, 3, and 4; VK0 (zero), 1, 2, 3, 4, 5, 6, 7, and 9), and in addition for each new call area worked on that band a bonus of 50 points will be added.

11. Logs submitted by overseas contestants should be set out as shown in this example (VK and ZL entries will modify their logs accordingly.)

VK-ZL DX Contest, 1959

Page 1

Name.....Section.....

Address.....Call Sign.....

Claimed Scores: Total.....

Band Scores: 80 Metres.....

40 ".....

20 ".....

15 ".....

11 ".....

10 ".....

Tx-Input Power.....Aerial(s).....

Declaration: I hereby certify that I have operated in accordance with the rules and spirit of the Contest.

Signed.....

Date.....

VK-ZL DX Contest, 1959

Page 2

Date Oct.	Band Mc.	Time G.M.T.	Station Worked	Serial Sent	Serial Received	Points Claim.	Bonus Points	(Leave Blank)
3rd	14	1054	VK2XYZ	57001	54027	5	50	
	14	1100	VK3ABC	54002	44131	5	50	
	14	1110	VK3AXQ	46003	57008	5	—	
	21	1220	VK3AZX	58004	56045	5	50	
	21	1230	ZL2XYZ	56005	57152	5	50	
	21	1257	ZL2ABC	55006	45013	5	—	
	21	1315	VK9XY	57007	58141	5	50	
	21	1405	VK9AB	59008	59016	5	—	

TOTAL (Points Claimed + Bonus Points) 40 + 250 = 290

[Contestants are requested to maintain "sent" serial numbers in the correct sequence and not to divide their logs into bands.]

THE

WARBURTON FRANKI PAGE

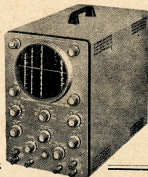
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Rise Time: 0.08 microseconds or less.
Overshoot: 10% or less.
PRICE: £62/10/0 plus 12½% S.T.
Deposit £17, £5 monthly for 12 months.



HORIZONTAL CHANNEL

Sensitivity: 0.3 volt (R.M.S.) per inch at 1 kc.
Frequency Response: Flat within ± 1 db. 1 c.p.s. to 200 kc. Flat within ± 3 db. 1 c.p.s. to 400 kc.
Attenuator: Low impedance type in cathode follower output.
Input Characteristics: Selector switch permits use of external input through panel terminal, line-frequency sweep of variable phase or internal sweep from sweep generator.
Horizontal Positioning: D.C. type; permits wide range of positioning to examine any part of trace even with full horizontal gain.
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POWER TRANSFORMERS: 80 mA. 385v. a side, 25v., 5v. and 6.3v. Secondaries, £1/15/9 each. Post. Vic. 3/9; Int. 6/-.

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Hi-Fidelity performance at LOW cost. The following wide-range types are available with either 2.7 or 15 ohm Voice Coil Windings.

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HF5	5"	4 watts	130-10 kc/s.	55/11	1/10	3/-
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8WR	8"	7 watts	30-15 kc/s.	£7/0/0	2/3	3/8
12WR	12"	10 watts	30-15 kc/s.	£7/9/7	2/11	4/4

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7 peak-to-peak ranges: 0-4 to 0-4,000.
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Size: 7½ x 4-11/16 x 4½ inches. Weight 7 lbs.
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(All above Post. and Pack. 4d. pair.)
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METERS: 4 inch Square Imported type—
0/1 mA. Plain or Multimeter Scale, 95/- plus 12½% tax.
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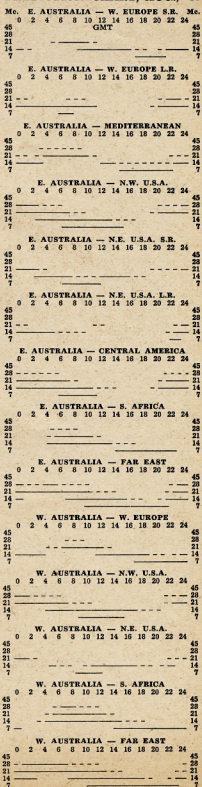
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A Sideband Man's V.F.O.

K. B. POUNSETT,* VK2AQJ

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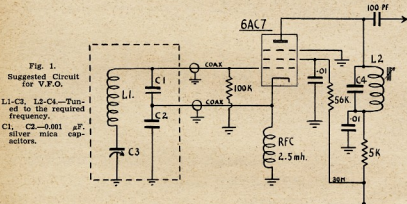
AS more and more Amateurs put sideband signals on our various bands, it becomes apparent that some advice should be put forward on the subject of oscillator stability in transmitters. Unfortunately there are a number of stations whose frequency slowly drifts away from that originally occupied. This causes continual retuning (and much tearing of hair) and destroys the wonderful advantage of voice-control operation. It is also a very bad advertisement for sideband and is a poor reflection on the technical ability of the operator.

The writer has this problem completely solved and the v.f.o. has no drift right from cold. The reason being it stays cold!

When in the process of building his first s.s.b. rig, the author did quite a lot of research on the stability of v.f.o.s. Most types of oscillators can be made reasonably stable by careful electrical and mechanical design. However, no matter how much care is

accitors are mounted in a very rigid cast aluminium box measuring 6" x 5" x 5". The capacitor is the plate tank tuning capacitor with its gearing intact taken from a Command transmitter and the coil is a large one, wound on a ceramic former obtained from a T.U. unit. The connections are made within the box with 1" copper tubing and the voltage dividing capacitors (C1 and C2) are silver mica types. A 6AC7 oscillator tube is used with good results and h.t. voltage stabilisation is not required (the author's line voltage has good regulation). If your line voltage varies considerably, glow tube regulation is recommended.

The co-axial lines between the tuned circuit and the oscillator tube can be up to about five feet long and the length will effect the frequency of the tuned circuit, so you will have to experiment with the L/C ratio. Aim at the highest L/C ratio that will maintain oscillation. The inductance or the capacitance of the tuned circuit is not



taken, when the oscillator frequency determining components change in temperature, alas, drift occurs.

The solution is to remove the v.f.o. tuned circuit from the heat. The source of heat being that radiated by the tubes in the transmitter. You are no doubt aware that after a very short time, the temperature of your transmitter cabinet has risen well above room temperature; so has your oscillator coil and tuning capacitor!

If the tuned circuit of the v.f.o. is removed several feet from the transmitter and connected to the oscillator tube by a couple of lengths of co-axial cable (or if you can get it, twin co-ax.) the coil and capacitor will remain as cool as the proverbial cucumber. This is not the only "keeping cool" effect. The guy you are talking to keeps cool too!

Getting down to practical details, at the writer's station, the coil and cap-

quoted as these will vary with your v.f.o. frequency and components available, but use a good quality variable capacitor and a ceramic coil former and give them plenty of room in the metal box. The value of C1 and C2 in this unit is 0.001 μ F.

When installing the v.f.o. box on your operating desk, please do not place it on your receiver or even up against it or all your work will be in vain; receivers usually get quite hot.

This approach to stability is recommended to all Amateurs, no matter what their mode of operation.

My signal stays put, does yours?

REFERENCES

- Long, "Cutting Down V.F.O. Drift," "QST," August 1952, p.20, and "S.S.B. for the Radio Amateur," 1st Ed. p.163.
- Brown, "A S-Watt S.S.B. Transmitter," "S.S.B. Techniques," p.61, "A.R.R.L. Handbook," recent editions.

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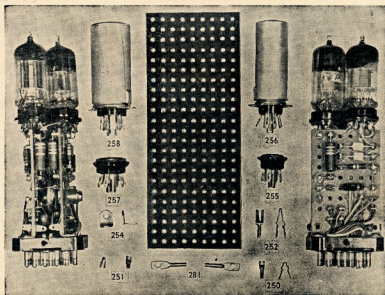
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Met Earl Scones and Max Johnston, who look very well. When I mentioned work they both laughed very subtly and looked at me as if I was silly. I'm beginning to wonder. If you hear the call sign 4EH, don't pass it by because it now belongs to our old friend, Les 3ALE, who is now in Brisbane. Sid 3CI is still working 10 m during his lunch hour, but no activity on other bands as yet.

Your zone correspondent has gone back to 20 m after having been ignored on 40 m, but don't think I won't be listening, so mind your P's and Q's.

WESTERN ZONE

During the past month Trev 3ATR and his XYL, Lynette, organised an "open house" for district Amateur friends. Also included were Mr. and Mrs. King. Mr. King is the local M.P., and during the evening he was given a thorough practical demonstration in the activities of Ham Radio. Some good contacts were made, also QRM was encountered, so it was easy to explain how it would affect our hobby if any more space in our bands was lost. Mr. King was so impressed and interested that perhaps we had a new Ham in the making. We must thank Trev and Lynette for this evening.

Trev's station was a worthy one for this occasion.

Thanks to the State Council for giving us the honour of holding the Annual State Convention in our zone this year. It will be held in Stawell on 3rd and 4th October. This date will give all those in the zone an opportunity of paying a visit to the Annual Flower Show which is held in Hall's Gap. This show is worth coming a long way to see, so chaps have been bugged to get in the mood for this trip. You will hear more regarding same in next magazine and we intend to make the whole show especially interesting for the XYLs and harmonics.

SOUTH WESTERN ZONE

The zone has been and is very active of late. The zone hook-up also has been very well attended, the main item being the threat to cut our hands, which will be a terrible thing to happen.

An interesting event took place in the zone on 14/8/59 when Gordon 3AGV, of Colac, using a crystal controlled two-transistor transmitter, was heard by 2WH in Forbes. Who taped Gordon's transmission and played the tape. The signals were identified by Gordon and self. Shortly before this, the transistor set was heard by self, this being the first transmission with the little rig. Power was only a few milliwatts and frequency in the 7 Mc. band.

3AGV now has a 144 Mc. tx using an 829B in the output, but has not been on the air with it. May have it running in July. Have also band-spread the AR7 on 7 Mc. and it now covers 7 to 7.25 Mc.

John 3AGD has at long last shifted his tower closer to the shack so we hope to hear him on a little more. On the none hook-up of 18/8/59 a voice came out of the silence and who should it be but Pat 3ADN (Lismore). John 3ABJ was portable at Bill Wines' QTH, so John called him in and we had a very good ragchew as Bill had not heard from Pat for years. Let's hope you can manage to come on the Thursday night hook-up.

Don't forget the South Western Zone Convention to be held during the week-end of 31st October and 1st November, in the premier town of Victoria—Warrnambool. There are plenty of motels that are very good. Why not bring the family along and make a week-end of it for the whole family?

If you intend coming and require accommodation, well just drop a line to Mr. Bill Wines, 48 Crawley St., Warrnambool, before 1st October.

GEELONG AMATEUR RADIO CLUB

The 11th Annual General Meeting was held in June and the election of office-bearers took place. This resulted in the following members being appointed: President, Dick 3ABK; Vice-Presidents: Bob 3IC, Jim 3ABT; Secretary, Vic Clark; Librarian and Equipment Officer, Bill Irwin; Publicity Officer, John 3AMC; Committee members (addition to office-bearers): Fred 3ALG, Bill 3BU, Bill Husin, Phil Costa.

The Club intends this year to put more emphasis on use of practical demonstrations with equipment in syllabus items.

Work on the Ch transmitter progressing under the supervision of Jim 3ABT and the Club's all-wave rx is being hotted up for the Ham bands by Eric Coxall.

Fred 3ALG has been heard on 50 mxx testing out his new rig; a Geloso v.f.o. with 6146 in the final. Peter 3ZAV is putting finishing touches to newly built shack and is planning to run 40w, to an 829B on 144 Mc. Antenna is an 11 element Yagi. Plans later to be on 56 and 280 Mc. Arch 3BW active with s.s.b. on five bands; is very pleased with the way it cuts through QRM on the DX bands—3AMC.

MOORABBIN & DISTRICT RADIO CLUB

At the meeting held on 19th June at the home of Ed. 3EM, some important business was ratified. As our Secretary, Laurie 3CN, having recently become engaged to be married, is in the throes of matrimonial preparations, Alf 3LC agreed to act as temporary secretary until such time as the air clears at Laurie's.

By the time these notes become published, the club hopes to be installed in its new club-rooms. These rooms comprise a newly constructed shack, 24 x 16 ft., on the property of Bob 3NZ at 17 College Gr., Black Rock, that address becoming the permanent and official address of the club. The club's station, 3APC, will be housed in these rooms, and poles are to be erected as soon as permission is granted by the local council.

We are all very indebted to Bob 3NZ for his generous offer of the premises, and are doing everything possible to make them easy and comfortable. Working bees are being held on Sundays for this purpose.

You will be hearing more of our official station, 3APC, in the near future, and I take this opportunity of urging members to make use of the facilities offered. A v.h.f. group is also being organised.

New OM's! Why not join us and make the club a really worthwhile club to belong to. The fee is only 10/- per annum, and meetings are held bi-monthly, the first Friday night of each month is a patter night, and the third Friday night of each month the general meeting, so come along and help to make some really super get-togethers—3LC.

QUEENSLAND TOWNSVILLE

The last meeting of the T.A.R.C. was again well attended and a few were present on the verandah of 4BX's, including two visitors brought along by Claude 4UX. As I arrived late, I did not get their names but hope they will be along again. It is pleasing to see the numbers growing and it is to be hoped some of the older members who have been absent for some time come along and voice their protests, etc., on everything in general.

Reports on the Palm Beach Convention were given by Alan 4PS. During the report by the Librarian he emphatically emphasised that members bring back the books each month (they can take them out again if they wish), thus permitting him to keep the records straight. Bob 4SW, in his report on the W.I.A., mentioned the article in local paper (back page) where the hydrogen bomb test in the Pacific had blacked out radio communication.

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★

**EIGHTH ANNUAL
CONVENTION**

**SATURDAY and SUNDAY,
3rd and 4th OCTOBER, 1959**

★

PROGRAMME:

Saturday, 7.30 p.m., October 3
Dinner at University of N.S.W., New-castle. Guest Speaker: Hon. Alan Fair-hall, M.I.L.R., VK2KB.

Sunday, Oct. 4, Blackalls Park—
9.30-10.30 a.m.: 144 Mc. Hidden Tx Hunt.
11 a.m.: W.I.A. Broadcast.
11.30 a.m.: Disposals Sale.
1.15-2.15 p.m.: 7 Mc. Scramble (no a.c. permitted).
3-4 p.m.: 144 Mc. Hidden Tx Hunt.
5.30 p.m.: Prizegiving, Farewells, etc.
Usual races and competitions for XYLs and Harmonics.
Boiling water will be available free.

**W.I.A. VICTORIAN DIVISION
SOUTH WESTERN ZONE**

CONVENTION

will be held on

**SATURDAY and SUNDAY,
31st OCT. and 1st NOV., '59**

at

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VICTORIA

for 3,000 miles. No wonder we had those freak conditions last year. Can anyone remember the bands behaving irrationally as they are doing now?

Our President Alan brought under notice a move to establish a far northern division of the W.I.A. in VK4. This was very forcibly discussed and decided to bring up again next meeting when the boys have had time to think it over. Perhaps if we get that new State for North Queensland and the Northern Rivers of New South Wales, it will be imperative that new W.I.A. centres will come into being.

John 2JU, in his editorial of current month, certainly drives the point home on the P.M.G. Department regarding "Amateur Frequencies". How come our commercial interest for such a small population want our little spectrum when overseas, with their teeming millions, are prepared to live and let live on the Amateur bands.

Brian 4ZBW has left for Darwin and the 50 Mc. boys are waiting for his signal to break through. John 4DD (Donald Duck) really wrapped up in the s.b.s. and has great hopes for the new tx. Colin and Vern from the Goldfields are still putting a signal on 144 Mc.

through to Townsville, and Ken 4ZAK is very happy with this band.

Eric 4EL, waiting for the day when he leaves Clevedon, the old home of the National station 4QW, and takes up his residence in town. You will be sorry when you hear the QRM! Joe 4JH hopes to make that t.v. ticket in December. Our wishes for good luck. Alan 4BE, Ted 4EI, and Len 4GD hardly heard on the band. Apparently no DX coming in of an evening. Bill 4ZBE still managing a couple of dozen QSOs with JA land on 50 Mc. a month and would like VKs to look in the Townsville direction. It appears that the band does not fade altogether in the winter, just that previously it was thought no good in the winter time with no activity. The local Met. Section say openings will occur when high pressure over the south-east corner and low pressure over the Kimberleys. The local boys are studying the weather maps to hear the VKs and VKIs.

No news to hand from Basil 4ZW of the doings on 7 Mc. band. It fades for short haul contacts now, but can hear W, LU, JA, etc., on phone and c.w. I even heard a CX on phone on this band.

SOUTH AUSTRALIA

The ever popular buy and sell (tender) night was once again its usual self at the last monthly get-together, where Warwick 4PS and Norm gave their collective talents to the programme. In fact they must have brought along more than their usual quota of talent, for in spite of a good volume of business the evening concluded earlier than usual. Not that that made the break-up any earlier, no Sir, the usual conclusion of the evening is a deal of it kerbside, but none-the-less enjoyable.

Your new system boys should see quite a roll-up at the next tender night, so start putting it aside in readiness please.

A recent circular from Secretary John gives some advice on some disposal of the lot allocated to members interested. It is understood this is a forerunner of similar disposals, you will hear more of this as we go along. When you get a notice inviting enquiries, and you want some of the gear offering, fill out the form and send it back smartly, so you won't get left out. No reply from you indicates no interest, so don't growl if you miss out due to your own fault.

By the time you read this you will be accustomed to the new time of the Sunday session, i.e. 9.0 instead of 10.0 a.m. before what chaos was made to fit into the use of 7146 Kc. by other Divisions. The new call-back frequency of 7125 Kc. is also the new one, and being nominated for the purpose, should be clear as from say 10.15 a.m. each Sunday until the call-back is over. The country members make use of this so keep QRM away from there is a courtesy to them anyway.

W.I.C.E.N. activity now down to gear maintenance, which is of course important enough in itself, and to Roll Call on alternate Sunday nights on 358 Mc. Members please keep your gear in its best usable condition and attend these roll-calls. Other people than ourselves hear these, and it behoves all members to display the efficiency on the air, so we will maintain a signal worthy of inclusion in any emergency net.

Tubby SNO has gone to U.K. on a six month tour of duty where he will be operating with the call sign of G3UJ, so keep your DX ears clear for that call; he will be pleased to maintain contact with us whilst there. His son, who is now in the U.K., next month to see if he can keep the "home fires" burning, hope you make it fellow, and the O.M. a call to announce your entry to the hobby.

By the way, as learned in the art as Tubby is, he apparently does not know about DX before dishes, for he was heard recently to make a contact "to get back to the station". Shame on you Tubby. It's a shocking example for us younger (!!) members.

Arch 5XK heard in QSO with Luke 5LL with a really smart signal—a new rig Lance? It sounded A1+ here. Heard from a little bit that Reg 5QR, tired of totalling up countries on c.w., was to turn his interest to s.b. with a phasing rig s-a-l-w-E-W-L; must have been right because most of the DX call came back to 5QR, with good signal reports, another convert. Who will be the next?

Les 5AX getting all excited as he sees Truss Trucks enter his street and men examine poles and insulators, looks like some action on the bad noise problem; don't kid yourself 5UA for the noise at the University is not to be compared with that in King St. Gawler, anyone has a patent noise limiter to end noise limiters and wants to try it out, guess where? King St. Gawler, of course.

Ron 5FY at Elizabeth continues to bowl them over on 40 and 15 mc with his 300 W. set using 12w., and takes his place on Sundays with the gang. Quite a few new calls, for here anyway, coming up on the callbook these days. Don 5ED, Gilbert 5GX to name a couple; join in boys, we like to hear you, don't just listen, put your spoke in 5FS need not butt in—don't know about him, so do well.

Talking of Fanny, he came to light with a suggestion developed from "CQ" on a Q5er Mark II. That surely must be a winner. The Technical Committee though so much of it that special sheets with all the information has been sent around. Amazing (a) that he recognised a good thing; (b) that he made it (c) that he gets "CQ" (d) that he got it to work. My respect for him has gone up a peg and in future will even ask him questions involving a possible technical answer.

Joe 5JT is now at the Alice; what about some 5 mc gear Joe? You would be surprised how many will QSO you if you did, and think of the lovely cards. As Joe never wastes



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OBITUARY

J. K. TWYGCROSS, VK6JT

One of the pioneers of Aviation Radio in Australia, born in Victoria educated in Perth, and saw Service with the R.A.N. in World War I.

Joined D.C.A. in 1938, and retired in 1955. In 1941 was made supervisor of Airways Operations in W.A. and later became Communications Supervisor.

Was a keen enthusiast and in later years confined his hobby to 144 Mc. Well liked by all, Jim will be missed.

Sympathy is extended to his wife, son and daughter.

words in a QSO, he would be able to make many contacts on even a short opening. Give some thought.

Carrier controlled modulation seems to be catching on these days; two good examples heard recently being Gilbert 82X and Dave 5DS, with Dave perhaps "best dressed". You must do that promised article Dave, the Tech. Ed. is all poised awaiting your effort.

Roy 5DA bit busy these days house-painting; Lethr 5LC heard at great strength again; Bill SHR not too far behind, either; Brian 4XW has settled in (in Perth) and a.m. Sundays please—sorry, 9.0 a.m. now); Burnie 5WC still to be heard but not yet in new shack; the Club outfit still operates from his home QTH.

GI8GB on the Orontes for VK5, so a new voice for VK5 soon, anyway welcome to VK5 and hope you will be able to make many contacts. Reg SRR and Bill SHR now qualify for R.C.C. having held a d.s.b. contact for over 1 hour.

Ron 5AD now resident in the metropolitan area, attended his first meeting at last month's Buy and Sell. Good to see you Ron, and hope you enjoyed meeting the gang.

Wally 4XW has really gone All Pansie. Yes Sir, he has revamped his gear into a cocktail cabinet-like affair (lounge room too, if you please) in walnut veneer and clear Forminex, hopes to get active in October prior to R.D. Contest. What with redecorating the rig and the whole room has kept him off the air, but no doubt he will make up for that. George 5KJ very busy on 20 mc. and still finds a rare one, how many now Pat? George 5KJ back from leave that he spent in the States, that is, Norm 5YM not heard for some time, too busy with the woolies, Norm?

Had a visit from Bram 5AB recently and pleased to learn of activities from down that way. All appears to be well, contacts aplenty, and conveyed to him a way to fix a dipole for 40 and 80, so let's hear you Bram. Gordon 5XU, that Third Method type, has announced a clean-up of his bench which is now down to the bottom layer. Surprising what he located in the clean up too, so if any of you loaned him anything during the last 10 years (last date of bench clean up) now is the time to apply for return of such loan. It's long overdue or the articles may get covered once again.

Tom 5TL has a new piece of gear, no, not his new tx, that sounds fine, but an antenna relay that according to him operates "but won't work!!" Want an explanation of that someday, anyway he has a new way of warming him, the him, the frosts, that is, a light stick and wave it around himself. If the fire on it doesn't warm him the expended energy will.

Les 50 Hawker reported may be on the air in a couple of years!! What's the hurry

Les' 50 in company with 3AVE and a couple of Ge heard from Edinburgh. Airlfield; Keith 5ZY making his 5 x 9 signal fit into the pattern well, with Bob 5BG his usual self. Well, fellows, this is the last time the report will come from this QTH, for due to many factors can no longer fit the task in to give a complete coverage. It has been an enjoyable job doing, and the past few years, and has always tried to cover as many of you as possible and be as accurate as the news sources would provide.

Will meet you on the bands from time to time, but perhaps not as often. Best of luck to you all and to my successor, whoever he may be.—73, Comps 5XZ.

TASMANIA

Now that Federal Executive has approved the appointment to the Federal Contest Committee of five members from the South, those who constitute that committee are spending a great amount of time in becoming familiar with the duties expected from such committeemen, and in preparing for the R.D. Contest this month and subsequent contests. Remember, chaps, an all-out effort in the R.D. Contest this year. Submit a log even if you have only the minimum of five contacts. Not only will the points help our Division, but also your efforts will support the national contest, a feat which is so important to us and which could be the feature to bring us success.

At the July Divisional meeting, a most interesting and informative presentation was delivered by Len TLE. So convincing was the address that more than one hardened c.w. man was afterwards heard to admit that there was perhaps some merit in that form of phone.

Eavesdropping on the bands this past month, I heard Bill TFY being mobile marine with a 10S and 80 m off the south-west coast of the State during the course of leave. Hugh TDS showed what a good fist he has during a brief appearance on 20 mc. Also heard Bill TTE and Harry TBR briefly on 40 mc. Reg T2AO has a kitten-powered tx operative now on 2 mc. Ken KTA is working toward suppressing one of the sidebands of his double sideband suppressed carrier rig.

This Division is now conducting slow Morse sessions on 1915 kc. on Monday, Wednesday, Thursday, Friday and Saturday each week with a view to helping prospective Amateurs and limited licensees gain their full license. We are most grateful for any reports on these transmissions.

Jack TJB is virtually off the air at present, due to power line noise from a 23kv. line immediately across the door. Only the strongest signals are readable. If something is not done about this soon Jack, you will have to change your QTH. Charlie is still active on 80 mc, having extended his antenna tuning unit to cover that band. Charlie is also in the course of building a new rx for himself.

Some of the southern members spent a recent Saturday painting the greater part of the house for Athol TAJ, who has been confined to bed for many months now. We all hope to hear you on the air with that excellent little portable, Athol. By the time this goes to press, wearier permitting, the rest of the painting should be completed.

We all regret that George T7G has sold the bits and pieces of his tx. In his own hand, we take comfort in his assurance that he has not so distant future he will be back on the air again and, we hope, as active as he was ten years ago.

NORTH WESTERN ZONE

Well chaps here we are once again after missing out last month. Please accept my apologies but unavoidable.

Our bi-monthly lecture night was held on July 6 at the usual meeting place, about a score of interested parties were present and we were treated to an interesting talk on the Royal Flying Doctor Service by a doctor throughout the inland outback of Australia, by our President, Lee T7C, who was at one time connected with the organisation in Western Australia.

Supper was once again served and many hands made quick work of cleaning up afterwards. George T2AO was in attendance and a vast quantity of the usual valuable and scarce items of "junk" were readily disposed of, resulting in a satisfactory addition to zone funds. A fear of it was taken away by the time all "business" was completed and the usual "natter" session was called off to a later date. If nothing else, the lecture notes and relevant experiences both on and off the air are exchanged during these alternate meeting nights.

The Ulverston High School is holding an Education and Science Exhibition in August

and the W.I.A. has been asked to place and make an exhibit. The organisation of such a show in hand, but more of this at a later session.

A.O.C.P. classes under expert instruction from Dennis TDR are progressing very satisfactorily at Ulverston and I think quite a number now have very high hopes that they will be "on the air" before too many more months go by—best of luck.

W.I.C.E.N. nets now include a phone section so we are hoping to get a lot more chaps interested in such emergency practice networks.

Everyone bagged themselves a VK9 during July, also a few more ZLs also. I am sincerely trust everyone has their gear tuned up and in good going order ready for the R.D. Contest on the 11th of the month, whoever who will win it this year—the VK6s sound pretty sure of themselves once again, but we shall see, so put your best foot forward VK7s and maybe everyone will get a surprise.

HAMADS

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Advertisements under this heading will only be accepted from experienced members who desire to dispose of equipment which is their own personal property. Copy must be received by 8th of the month, and remittance must accompany advertisement. Calculated at the rate of one word on an average of six words a line. Dealers' advertisements not accepted in this column.

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WANTED: Handbook No. 22 Set and "Amateur Radio" for January 1955. Don Robinson, C/o. Telephone Exchange, Narrandera, N.S.W.

WANTED: Instruction Handbook and Power Supply for 122. A. G. Swinton, 156 Avoca Rd., Avoca Beach, N.S.W.

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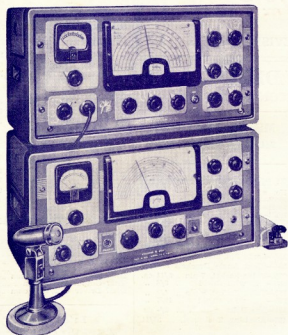
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AMATEUR BAND H.F. TRANSMITTER and RECEIVER COMPANION UNITS



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Six H.F. Bands—80 to 10 Metres

Main Features Include:

- Simple, rapid changing of operating frequencies and bands.
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